



SURFORMA®

Shaping Spaces

CompactShield



interzum



AWARD

High Product Quality

2023

BALLISTIC PROTECTION

DEC 2024

CompactShield Ballistic Decorative Compact

Decorative solutions for Preserving life.



A growing consciousness of the threat associated with armed conflicts, terrorist acts and wars led Surforma to develop and introduce solutions for life protection to its portfolio.

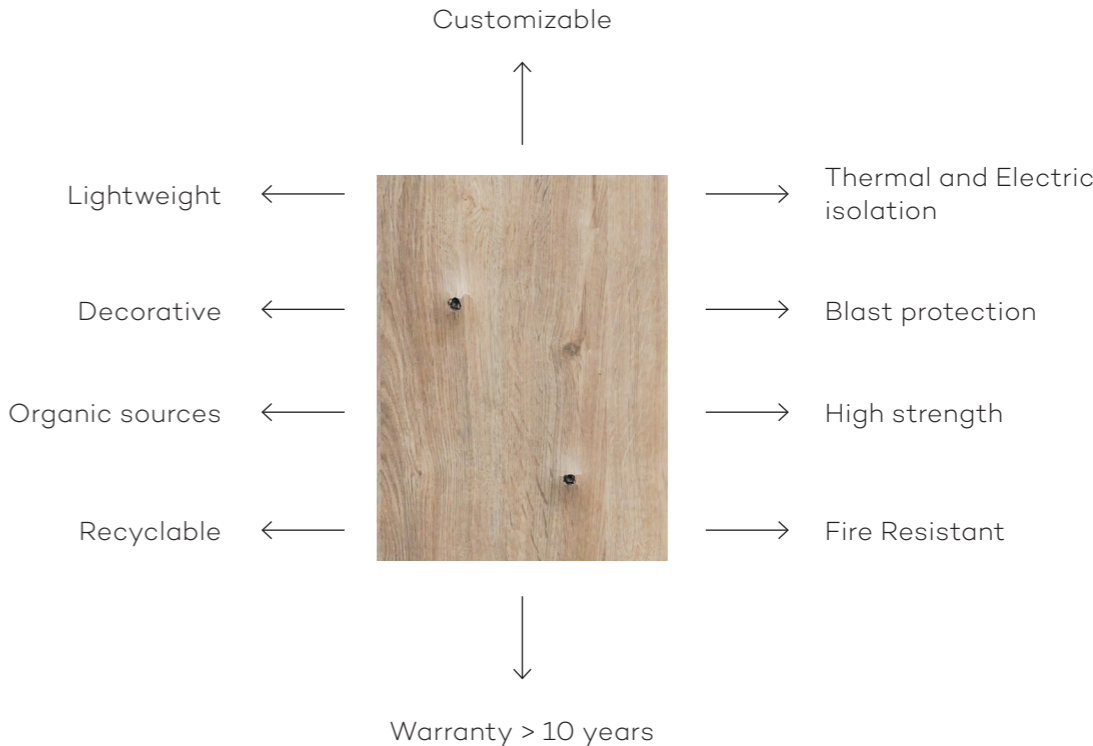
Surforma with its partner, Beyond Composite, have developed ballistic decorative compacts using composite materials based on nanotechnology, advanced fibrous materials and high energy absorption structures. Together it results on a lightweight, strength and high energy absorption Compact for ballistic protection. CompactShield can be double-sided decorative.



SURFORMA was created in 1959 and is the origin of the Sonae Group, a Portuguese multinational that is present in more than 60 countries and manages a diversified portfolio of businesses in various industries. Currently EFANOR group turnover exceed €8 billion.

Beyond Composite is a Portuguese company, founded in 2018, in the field of engineering, specializing in advanced composite materials for defense.

A sleek, lightweight ballistic compact crafted with advanced materials for effective protection.



From conception to production, entirely **European**

BALLISTIC SOLUTIONS FOR MOBILITY



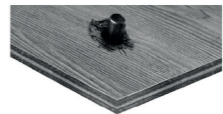
NATO STANAG 4569
Levels 1 to 4

BALLISTIC SOLUTIONS FOR PERSONAL PROTECTION



NIJ Standard 0108.01
Levels II to IV

BALLISTIC SOLUTIONS FOR CONSTRUCTION



NIJ Standard 0108.01
Levels IIIA to IV

STANDARDS & LEVELS of PROTECTION

SURFORMA® CompactShield materials were tested under the U.S. National Institute of Justice's Standard for Ballistic Resistant Protective Materials, standard NIJ 0108.01 stopping different caliber shots, depending on the protection level aimed, without piercing the material and the ammunition remains locked inside. The validation tests were done in a certified independent ballistic laboratory.

NIJ 0108.01	LOW CALIBER HANDGUN		MEDIUM CALIBER HANDGUN		RIFLES	
	I	II-A	II	III-A	III	IV
Gun						
Bullet	 22 LRHV 38 Special	 357 Magnum 9 mm	 357 Magnum 9 mm	 44 Magnum 9 mm	 7.62 mm 308 Winchester	 30-06 AP
Velocity (m/s) by type of bullet	320 259	381 332	425 358	426 426	838	838

In Europe, other classifications can be found using standards such as **BS EN 1063** (2000), which is a security glazing standard created by the European Committee for measuring the protective strength of bullet-resistant glass. It is commonly used in conjunction with **BS EN 1522** (Euro norm standard for Bullet Resistance in Windows, Doors, Shutters and Blinds) to form a ballistic classification system by which armored vehicles and structures are tested and rated. However, it is a similar classification system as for NIJ 0108.01, which includes glass and armor plate.

BS EN 1063	LOW CALIBER		MEDIUM CALIBER HANDGUN		RIFLES		SHOT GUN
	BR1	BR2	BR3	BR4	BR5	BR6/BR7	SG1/SG2
Gun							
Bullet	 22 LRHV	 9 mm luger	 357 Magnum	 44 Magnum	 5.56 mm	 7.62 mm	 12/70
Velocity (m/s)	360	400	430	440	950	830/820	420

BS EN 1522	FB1	FB2	FB3	FB4	FB5	FB6	FB7	FBG
Weapon								
Ammunition	 .22 LR L/RN	 9 mm Luger FJ1/RN/SC	 .357 Magnum FJ1/CB/SC	 .44 Rem Magnum FJ2/FN/SC	 5.56 mm x 45 FJ2/PB/SCP 1	 7.62 mm x 51 FJ1/PB/SC	 7.62 mm x 51 FJ2/PB/HC 1	 12/70 Solid Slug 3
Velocity (m/s)	360	400	430	440	950	830	820	420

For military application, the standard used is **NATO STANAG 4569**.

STANAG 4569 is a NATO standard that establishes protection levels for occupants of logistic and light armored vehicles. This standard is crucial in ensuring the safety and survivability of military personnel operating in various combat scenarios.

The STANAG 4569 standard defines specific ballistic and blast protection levels based on threat classifications, such as small arms fire, artillery fragments and mine explosions. These protection levels are categorized into different classes, with each class representing a specific level of protection. The higher the class number, the greater the protection provided.

STANAG 4569	LOW CALIBER		MEDIUM CALIBER		HEAVY CALIBER	
	I	II	III	IV	V	
Weapon						
Bullet	 7.62 x 51 NATO Ball 5.56 x 45 NATO SS109 5.56 x 45 M193	 7.62 x 39 API BZ	 7.62 51 (WC core) 7.62 x 54R B32 API	 14.5 x 114AP / B32	 25 mm APDS-TM-791	
Velocity (m/s) by type of bullet	833 900 937	695	854 930	911	1258	

For comparison purposes, level **IIIA** of NIJ 0108.01 is equivalent to level **BR4** of BS EN 1063 and level **FB4** of BS EN 1522

Level **III** of NIJ 0108.01 is analogous to level **BR6/BR7** of BS EN 1063, with level **FB6/FB7** of BS EN 1522 and to level **1** of STANAG 4569.

APPLICATIONS

CompactShield by Surforma® is ideally suited for public either residential spaces in a variety of applications including doors, wall cladding and interior fittings and partitions, for the sectors of government and military buildings, banks, education, hospitals and healthcare, hotels and restaurants, offices, shops.

CompactShield is also particularly interesting for transportation industry such as trains, buses or airplanes because of the lightweight and reduced thickness characteristics.

Surforma offers a wide range of **decorative** variations of CompactShield with the ultimate goal of satisfying the requirements from interior designers and architects.

CompactShield with **decorative surface**, according to EN 438, is an excellent material for indoor surfaces, either horizontal or vertical where design, appearance, quality and durability are important features.

The double-sided decorative CompactShield meet the stringent requirements for hygiene, resistance to abrasion, scratches, stain and resistance to heat from ordinary sources, dimensional stability and mechanical properties.

The product can also be provided without any decorative surface for inclusion inside a wall or door structure.

The CompactShield **without decorative surfaces includes a functional layer specifically** developed to create a structural combination, enabling the composites to be glued to other materials such as metals and ceramics.

Surforma® was honored with three Interzum High Product Quality Award 2023.

This award as part of a competition it is given to companies exhibiting at the Interzum and granted by an International expert jury for outstanding achievements, which set new standards in line of business.

The award which combines innovative aspects of material, function, and design, in an exemplary fashion went to:

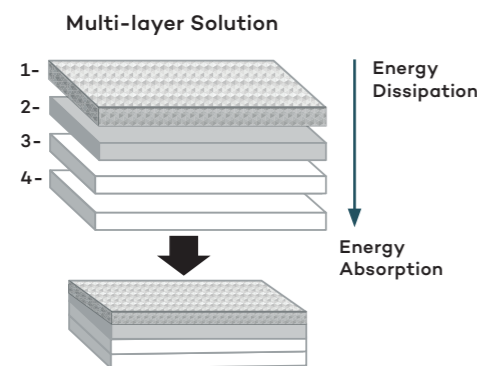


CUSTOMIZATION APPROACH



CompactShield is conceived to be a customized solution that is evaluated and designed to fulfill the need of the client in terms of level of protection, weight, thickness and other characteristics, alone or in combination with other materials such as armored steel or ceramics.

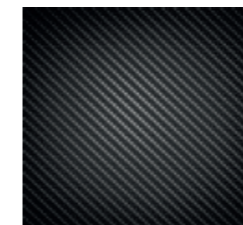
CompactShield is designed using a selection of different materials, depending on the characteristics required by the client. These materials are combined in a carefully studied manner to enhance the intrinsic properties of each raw material. The raw materials are then pressed at high pressure and temperature to create a compact material tailored for specific applications and capable of withstanding defined environments.



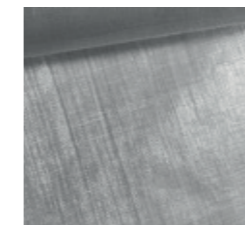
The composite material used in ballistic boards exhibits thermal, chemical, and mechanical resistance, enabling it to withstand extreme conditions while maintaining its structural integrity, providing reliable protection even in demanding environments.

MATERIALS and PERFORMANCES

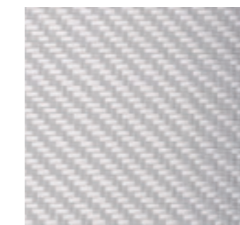
Depending on the specific application, materials like carbon fiber, UHMWPE (Ultra-High-Molecular-Weight Polyethylene) and glass can be utilized in combination to offer multi-scale solutions for various protective needs.



Carbon Fiber



UHMWPE



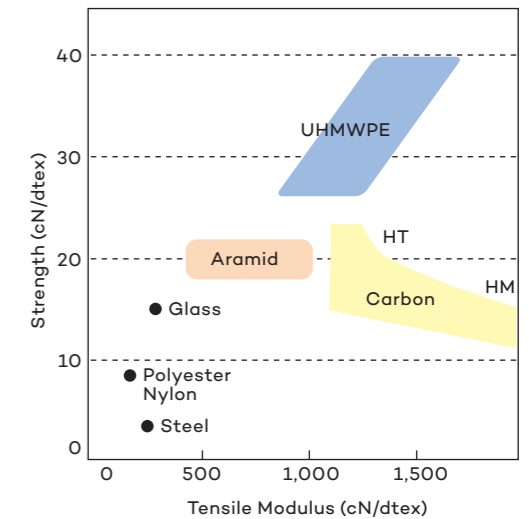
Glass Fiber

Ultra-high-molecular-weight polyethylene (UHMWPE)

A remarkable high-performance fiber, has emerged as a groundbreaking innovation in the materials industry. Discovered in the 1960s, this UHMWPE offers exceptional strength while maintaining an incredibly lightweight profile.

Strength and Stiffness

UHMWPE is a high-strength polyethylene known for its excellent stiffness and tensile strength. Compared to Aramid, UHMWPE is up to 15 times stronger. Even when compared to Carbon, UHMWPE can offer comparable strength, making it a popular choice in applications where robustness is essential.



Lightweight

One of the primary advantages of UHMWPE is its lightweight nature. While Aramid and Carbon are notoriously light in their own right, UHMWPE is even lighter, allowing for the manufacture of thin and lightweight products without compromising strength and durability.

Flexibility and Durability

UHMWPE is known for its exceptional flexibility and durability. Unlike Carbon, which is rigid and can break under extreme stresses, UHMWPE has a unique ability to absorb impacts and bend without losing its mechanical properties.

Moisture and UV Resistance

While Aramid can lose its strength when exposed to damp environments, and Carbon composites may degrade with prolonged UV exposure, UHMWPE is resistant to both conditions.

Thermal and Electric Conductivity

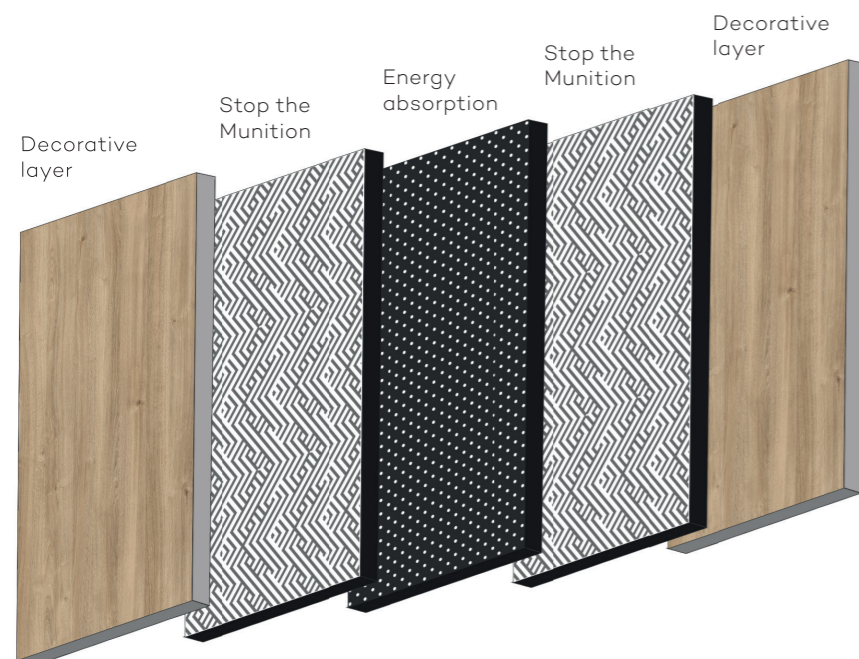
Compared to steel, CompactShield shows a high reduction in thermal and electrical conductivity.

Flame Resistance

The product comply with the standard FED-STD-191/5905.1 that define the requirements of Federal and Military Specifications.

Decorative Surface

The melamine surface is highly resistant to abrasion, scratches, stain and resistant to heat from ordinary sources, dimensional stability and mechanical properties. The decorative surface is ANTIBACTERIAL.



STANAG and NIJ.0108.01 SOLUTIONS

Examples of STANAG SOLUTIONS

PROTECTION LEVELS FOR OCCUPANTS OF LOGISTIC AND LIGHT ARMoured VEHICLES				
STANAG 4569	AMMUNITION	MASS / m ² (KG)	THICKNESS (mm)	MATERIALS
1	7.62 MM X 51 NATO BALL (833 m/s) 5.56 MM X 45 NATO SS109 (900 m/s) 5.56 MM X 45 M193 (937m/s)	18-48	15 - 22	CompactShield Ceramic
2	7.62 mm x 39 API BZ (695 m/s)	49-60	23 - 27	CompactShield Ceramic or Steel
3	7.62 mm x 54R B32 API (854 m/s) 7.62 mm x 51 AP (WC core) (930 m/s)	70-80	28 - 34	CompactShield Ceramic or Steel
4	14.5 mm x 114 API/B32 (911 m/s)	80-100	35 - 43	CompactShield Ceramic or Steel

Examples of NIJ.0108.01 SOLUTIONS

BALLISTIC RESISTANT PROTECTIVE MATERIALS				
NIJ 0108.01	AMMUNITION	MASS / m ² (KG)	THICKNESS (mm)	MATERIALS
IIIA	357 MAGNUM JSP (425 M/S) 9MM FMJ (358 M/S)	55 - 26	6 - 13	CompactShield
III	7.62 mm (838m/s) 308 Winchester FMJ (838m/s)	18 - 59	18 - 28	CompactShield
IV	30 - 06 AP (838 m/s)	43 - 56	29 - 34	CompactShield Ceramic

Military Applications

Stanag Solutions

The **CompactShield** can be utilized as a **SPALL LINER** when installed in the crew compartment of a vehicle. Its purpose is to prevent fragments (spall) generated during an impact from being propelled towards the occupants of the vehicle.

The spall liner can serve both as an additional safety measure alongside the armor system and as an integral component of the protection system, capitalizing on the exceptional energy-absorbing properties of the fibers.

When provided as panels, the spall liner appears as a solid composite plate, consolidated through a customized resin system to meet operational and environmental requirements. This imparts notable rigidity and durability to the plates.

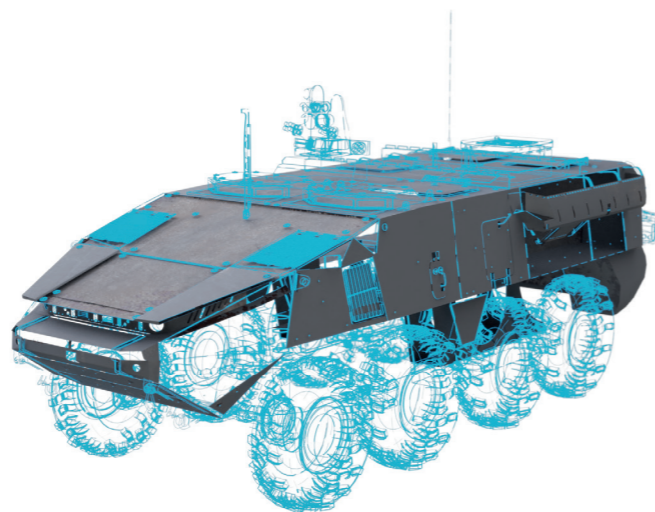
The panels integrate cutouts for mounting and packaging interfaces to better conform to the vehicle.



The **ADD-ON** armor can effectively enhance the level of protection for existing and new vehicles. Through composite technology, the added weight to the vehicle can be reduced, enabling the implementation of high-level protection solutions even for lightweight vehicles, without compromising mobility.

Add-on armor systems are customized to address specific threat requirements, incorporating different types of materials into the armor solution and considering any existing base armor, such as the steel or aluminum structure of the vehicle hull. This makes all armor solutions provided unique to the specific application and scenario.

The **CompactShield** is dedicated to developing lightweight and durable armor solutions to counter ballistic threats and improvised explosive devices (IEDs) encountered in the current battlefield.

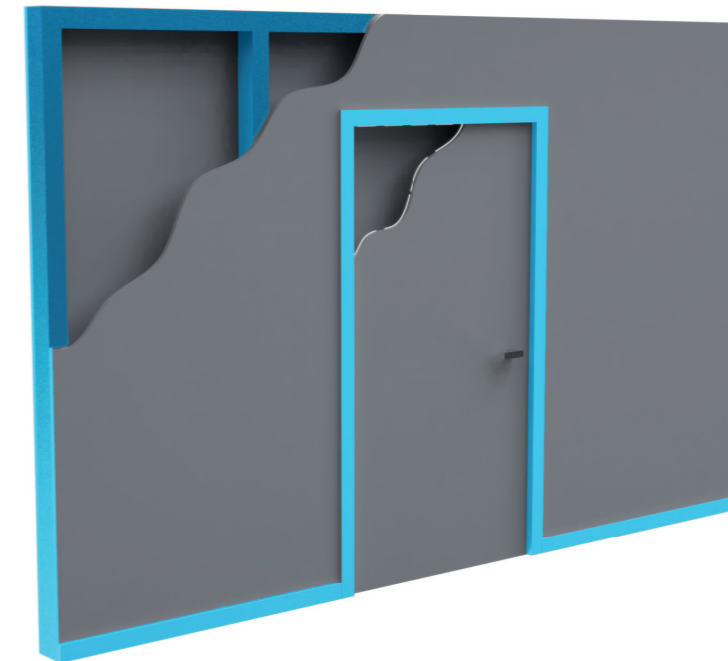


STRUCTURAL ARMOR solutions are meticulously designed to counter threats beyond the scope of mobility.

This dual flexibility empowers designers to seamlessly incorporate armor panels as fundamental construction elements in shelters, containers, buildings and even individual components like doors.

Furthermore, this innovative approach not only enhances security but also offers the advantage of seamless integration, ensuring a perfect harmony between protective functionality and architectural design.

With the capability to adapt and customize structural armor solutions to meet specific needs of each application, CompactShield is at the forefront of creating secure and resilient environments where protection and aesthetics effectively and innovatively intertwine.



Beyond Composite, the SURFORMA® partner, has a license from the Portuguese Government to sell products for military applications.



Venda de equipamentos militares
Despacho 9395/2022

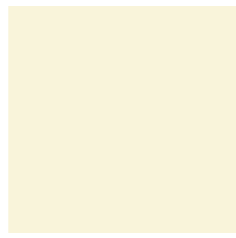
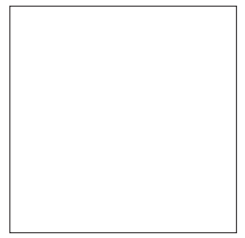
SURFORMA PRODUCT OFFER

Disclaimer

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Unique White
B4401

Light Grey
L166

Dark Grey
L167

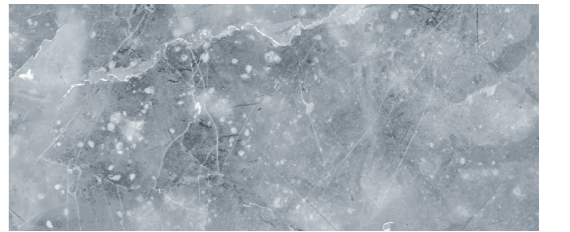
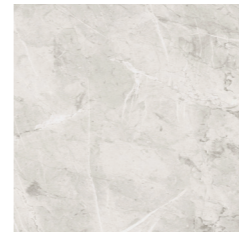
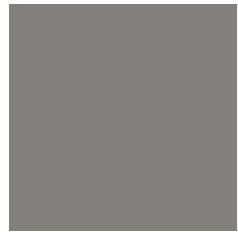
White Antique
L174

Jade
L212

Guava
L5237

Daylight
L6084

Storm Grey
L6274



Basalt
L927

Avocado
L969

Black
L3031

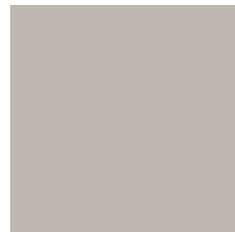
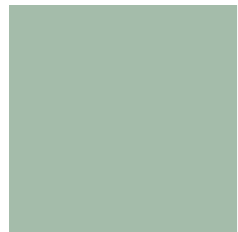
Medium Grey
L4068

Yin Marble
F2272

Yang Marble
F2273

Palazio Gold
F2278

Palazio Silver
F2279



Mint
L4085

Cotton
L5200

Frozen Blue
L5203

Bambus
L5206

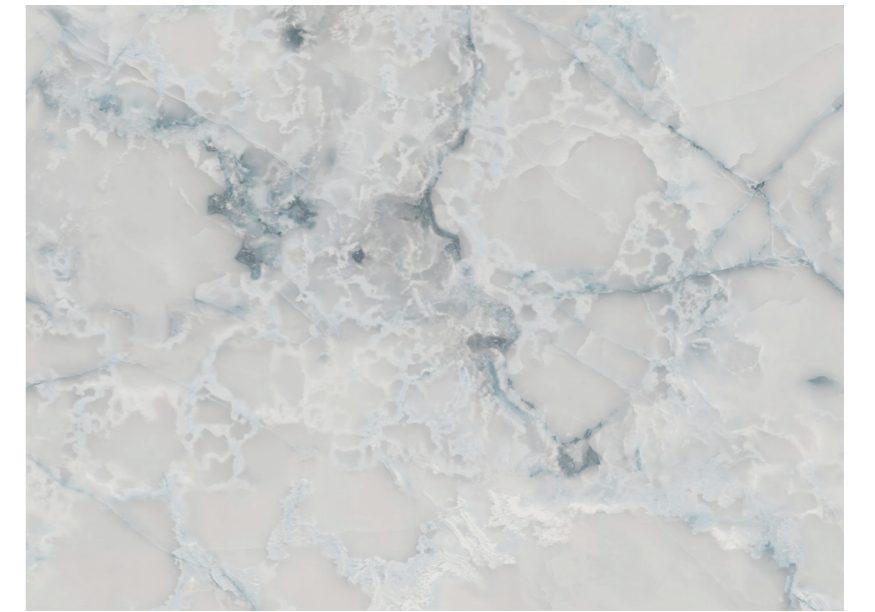
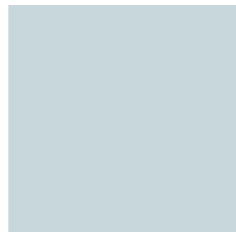
Camouflage
L5207

UrbanStone Graphite
F2282

Artwall Grey
F2300

Artwall Anthracite
F2301

Artwall
F2302



Opal
L5209

Hot Pepper
L5219

Mango
L5223

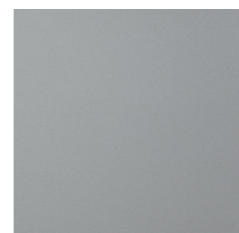
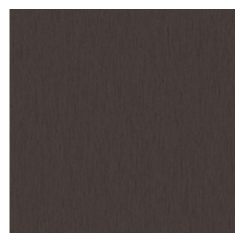
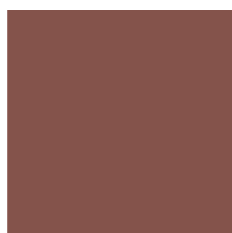
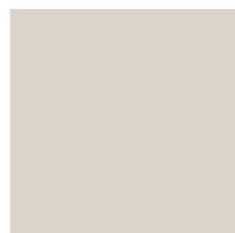
Almost Blue
L5225

Azurite
L5230

Feel Light Grey
F2313

UrbanStone Chalk
F2280

Onyx Nacre
F2317



Paprika
L5232

Nude
L5233

Hindu
L5234

Deer
L5236

Titanium Dark
F2305 (V)

Metallic
F4004



Iguazu Oak
M999

Troia Walnut
M2511

Sonoma Oak Natur
M6120

Lorca Oak
M4289

Whitewood
M3866



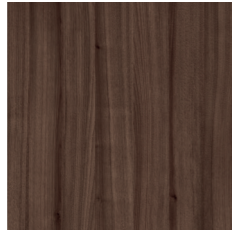
Bari Oak Grey
M6251

Bari Oak Nature
M6252

Cosmopolitan #1
M6282

Mapuche Beige
M6289

Mapuche Grey
M6290



Smart Ash Light
M6305

Smart Ash
M6306

Smart Ash Dark
M6307

Ethnic Fire
M6300

Amundsen Oak
M9275



Karlstad Oak Pale
M6323

Artisan
M6322

Karlstad Oak Grey
M6344



Medieval Oak
M6345

Aura Maple
M6348

CompactShield Offer

Disclaimer: available sizes and thickness by protection level are defined in the Price List				COMPACTSHIELD		
				2500 X 1150	3000 X 1150	2750 X 1500/1550 3660 X 1500/1550
FAMILY	REFERENCE	DECOR NAME	LRV (LIGH REFLECTANCE VALUES)	DEPENDING ON PROTECTION LEVEL		
WHITE	B4401	UNIQUE WHITE	87,0	LP	LP	LP
GREY	L166	LIGHT GREY	54,8	LP	SC	LP
GREY	L167	DARK GREY	12,2	LP	SC	LP
BEIGE	L174	WHITE ANTIQUE	84,1	LP	SC	LP
PASTEL BLUE-GREEN	L212	JADE	39,4	LP	LP ; SC	LP
TAUPE	L927	BASALT	26,0	LP	SMA	LP
GREEN	L969	AVOCATO	14,0	LP	LP ; SC	LP
BLACK	L3031	BLACK	6,1	LP	SC	LP
GREY	L4068	MEDIUM GREY	35,5	LP	SC	LP
PASTEL BLUE-GREEN	L4085	MINT	55,4	LP	LP ; SC	LP
TAUPE	L5200	COTTON	56,3	LP	SMA	LP
BLUE	L5203	FROZEN BLUE	46,9	LP	SMA	LP
PASTEL GREEN	L5206	BAMBUS	32,0	LP	SMA	LP
PASTEL GREEN	L5207	CAMOUFLAGE	19,1	LP	SMA	LP
PASTEL BLUE-GREEN	L5209	OPAL	13,7	LP	LP ; SC	LP
RED	L5219	HOT PEPPER	10,6	LP	LP ; SC	LP
YELLOW	L5223	MANGO	83,3	LP	SMA	LP
BLUE	L5225	ALMOST BLUE	72,4	LP	SMA	LP
BLUE	L5230	AZURITE	7,7	LP	LP ; SC	LP
ORANGE	L5232	PAPRIKA	16,8	LP	LP ; SC	LP
BEIGE	L5233	NUDE	64,6	LP	SMA	LP
RED	L5234	HINDU	13,1	LP	LP ; SC	LP
YELLOW	L5236	DEER	32,0	LP	SMA	LP
PINK	L5237	GUAVA	36,0	LP	SMA	LP
GREY BEIGE	L6084	DAYLIGHT	56,6	LP	LP ; SC	LP
BLUE	L6274	STORM GREY	17,6	LP	SMA	LP

Disclaimer: available sizes and thickness by protection level are defined in the Price List				COMPACTSHIELD		
				2500 X 1150	3000 X 1150	2750 X 1500/1550 3660 X 1500/1550
FAMILY	REFERENCE	DECOR NAME	LRV (LIGH REFLECTANCE VALUES)	DEPENDING ON PROTECTION LEVEL		
STONE	F2272	YIN MARBLE	22,0	LP	STU	LP
STONE	F2273	YANG MARBLE	61,0	LP	STU	LP
STONE	F2278	PALAZIO GOLD	22,9	LP	CMS	LP
STONE	F2279	PALAZIO SILVER	40,5	LP	CMS	LP
STONE	F2280	URBANSTONE CHALK	64,9	LP	CMS	LP
CEMENT	F2282	URBANSTONE GRAPHITE	12,4	LP	CMS	LP
CEMENT	F2300	ARTWALL GREY	48,4	LP	STU	LP
CEMENT	F2301	ARTWALL ANTHRACITE	25,9	LP	STU	LP
CEMENT	F2302	ARTWALL	53,1	LP	STU	LP
METALLIC	F2305	TITANIUM DARK	22,0	LP	SC	LP
FANTASIES	F2313	FEEL LIGHT GREY	29,0	LP	CMS	LP
MARBLE	F2317	ONYX NACRE	55,0	LP	SMA	LP
METALLIC	F4004	METALLIC	47,8	LP	SC	LP
OAK	M999	IGUAZU OAK	55,2	LP	FLW	LP
WALLNUT	M2511	TROIA WALNUT	13,6	LP	SMA	LP
ASH	M3866	WHITEWOOD	75,7	LP	NTL	LP
OAK	M4289	LORCA OAK	48,3	LP	SMA	LP
OAK	M6120	SONOMA OAK NATUR	27,0	LP	NTL	LP
OAK	M6251	BARI OAK GREY	49,4	LP	FLW	LP
OAK	M6252	BARI OAK NATURE	39,9	LP	FLW	LP
OAK	M6282	COSMOPOLITAN #1	38,4	LP	FLW	LP
ELM	M6289	MAPUCHE BEIGE	52,2	LP	FLW	LP
ELM	M6290	MAPUCHE GREY	57,6	LP	FLW	LP
EXOTIC	M6300	ETHNIC FIRE	19,4	LP	FLW	LP
ASH	M6305	SMART ASH LIGHT	43,9	LP	FLW	LP
ASH	M6306	SMART ASH	28,4	LP	FLW	LP

Disclaimer: available sizes and thickness by protection level are defined in the Price List				COMPACTSHIELD		
				2500 X 1150	3000 X 1150	2750 X 1500/1550 3660 X 1500/1550
FAMILY	REFERENCE	DECOR NAME	LRV (LIGH REFLECTANCE VALUES)	DEPENDING ON PROTECTION LEVEL		
ASH	M6307	SMART ASH DARK	15,5	LP	FLW	LP
OAK	M6322	ARTISAN	30,0	LP	FLW	LP
OAK	M6323	KARLSTAD OAK PALE	39,0	LP	FLW	LP
OAK	M6344	KARLSTAD OAK GREY	25,0	LP	FLW	LP
OAK	M6345	MEDIEVAL OAK	39,0	LP	FLW	LP
MAPLE	M6348	AURA MAPLE	63,0	LP	FLW	LP
OAK	M9275	AMUNDSEN OAK	56,6	LP	NTL	LP

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